Constituents of Dysprosium Holmium Erbium Thulium
Ytterbium and Lutecium

Continuing my examination of the rare earth elements
by the method of anodic sep as already reported
(Nature Dec 16, 1933) I have now been able to
complete the analysis of the group.

Dysprosia (66) gave poor spectra but appeared
to underlie that of crude of mean atomic numbers
161, 162, 163, 164 not differing much in relative
abundance

Holmium (67) is next definite simple 165

Erbium (68) is not a simple as it was first
supposed to be. The early samples used were evidently
contaminated with neighbouring elements
impure. A pure sample gave lines they have
166, 167, 168 and a weaker one 170

Thulium (69) is simple 169

Ytterbia (70) appears to contain three isotopes
171, 172, 173, 174, 176. Of which 174 is the strongest.

Lutecium (71) is simple 175

It will be seen that these six elements fill all
the numbers from 161 to 175 and have no isotopes
shown

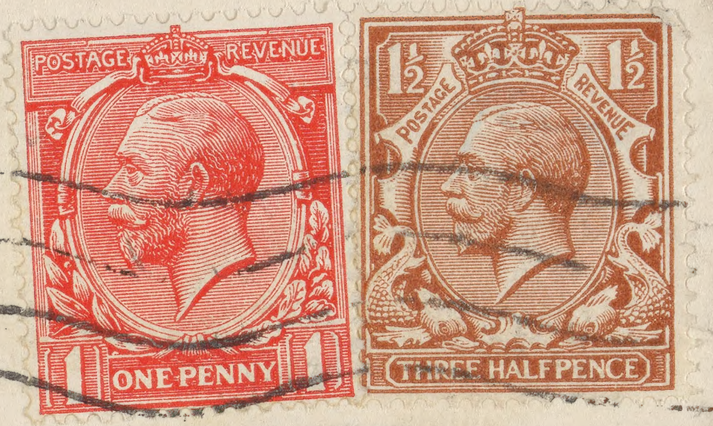
DSI

A full account of the work will be published in due course with details of solar observations and the above results deduced. It is always evident that the Fraunhofer lines of the rare earths are in need of revision. That of Holmium (163.5μ) is particularly bad.

Cavendish Laboratory
Cambridge
Feb 17

J. W. Nicholson

DSI



Dr. Ing. Armin Weiner,

Generaldirektor

der Westmährischen Elektrizitätswerke A. G.

Brünn, Nová 36.

DSI

DORKING
SURREY
6.45 PM
27 JUN 34

Dr. Ing. Armin Weiner,

Nova 36,

Brünn,

Czechoslovakia

DSI

Aston, Francis William

TRINITY COLLEGE,
CAMBRIDGE.

July 15th/24

Dear Sir

I regret that on
I Type all my Correspon
dence. I have little fun
Im purpose.

I enclose a reply Penny
Postcard to a letter recently
published in 'Nature' by
them in my

AUTOGRAPHE

de

Aston

Francis William

OBSERVATIONS

1.L.a.s. 1 p.8, Trinity-College, Cambridge, 1.7.1934, an Dr. Weiner, bedauert, alle seine wissenschaftlichen Arbeiten mit Maschine zu schreiben, sodass er kein Manuskript senden kann; übermittelt deshalb einen Bleistiftentwurf für einen wissenschaftlichen Brief, der in der Zeitschrift „Nature" veröffentlicht worden ist.

2.M.a.s. 1 1/2 p. 4, Cavendish-Laboratory, 17.2./1934/. Bleistiftentwurf zu dem in „Nature" Nr. 3357 Vol.133 Samstag den 3. März 1934 veröffentlichten Aufsatz mit dem Titel „Constitution of Dysprosium, Holmium, Erbium, Thulium, Ytterbium and Lutecium".

A s t o n , Francis William.
Chemiker.

Geb.1.9.1877, Harborne b.Birmingham

Stud. Birmingham Chemie, anfangs Gärungschemie, dann die Entladungserscheinungen d. Elektrizität in Gasen. Wurde 1909 a.o. Prof. am chem. Laboratorium in Birmingham. Im gleichen Jahre am Trinity College in Cambridge, wo er bei I.Thomson am Cavendish-Labor. arbeitete. War während des Krieges Leiter d. Aircraft-Factory, aber schon 1919 wieder am Cavendish-Lab. Erfand den Massenspektrographen, mittels dessen er die Isotopie bei nichtradioaktiven Elementen nachzuweisen vermochte. Diese wichtige u. bahnbrechende Entdeckung trug ihm den Nobelpreis für Chemie u.vielfache andere Auszeichnungen ein. Den Nobelpreis erhielt er zuerkannt „Für seine Entdeckung vom Verhalten von Isotopen-Gemischen bei vielen nichtradioaktiven Grundstoffen sowie f.d.Entdeckung des sog. Gesetzes d.Ganzzahligkeit.

DSI

Nature, No.3357,Vol.133, Saturday,March 3,1934.

Constitution of Dysprosium, Holmium, Erbium, Thulium, Ytterbium and Lutecium.

Continuing the examination of the rare earth elements by the method of anode rays as already reported,[1/] I have now been able to complete the analyses of the group.

Dysprosium /66/ gave poor spectra but sufficient to indicate that it consists of mass numbers 161, 162, 163, 164 not differing much in relative abundance.

Holmium /67 / is quite definitely simple 165.

Erbium is not so complex as it was at first supposed to be. The early samples used were evidently contaminated. A pure sample gave three strong lines, 166, 167, 168 and a weak fourth 170.

Thulium / 69 / is simple 169.

Ytterbium /70/ appears to contain mass numbers 171, 172, 173, 174, 176, of which 174 is the strongest.

Lutecium /71/ is simple 175.

It will be seen that these six elements fill all the numbers from 161 to 176 and show no isobares.

A full account of this work will be published in due course with astimates of relative abundance and the atomic weights so deduced. It is already evident that the international values for several of the rare earths are in need of revision. That of holmium /163.5/ is particularly bad.

F.W. Aston.

Cavendish Laboratory,
Cambridge.
Feb.17.

1/ Nature,132,930,Dec.16,1933.

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ISD